# 2D SENSE Mounting and Installation Guideline

Document TBS-032 for TCOM400 board revision 04


NOTE: The latest version of this document is always available at:
https://cloud1.tbs-biometrics.com/index.php/s/Pn7MZFC1EwLzwED

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| Revision | Author | Comment |
|---|---|---|
| October 22, 2021 | AG/TO | First Release |
| April 13, 2022 | AG/TO | Name change from 2D TERMINAL to 2D SENSE |
| June 8, 2022 | AG/TO | Updated installation environment |
| December 23, 2022 | AG | Added Wiegand 3.3V limitation, RS232/485 switch |
| June 12, 2025 | AG | Added Wifi & BL & Tamper, Outdoor installation, Network Ports, removed PoE |

## Content

# 1 Introduction

The TBS 2D SENSE brings Access Control and Time & Attendance applications featuring biometrics to a new level. It combines highest security with user convenience and the most flexible configuration options on the market.

This installation manual provides information and instruction for the 2D SENSE. The product is available as flush mount or as wall mount option.

*Table 1: Product Models available for 2D SENSE*

| Terminal Class | Mounting Option | RFID Card Reader Option | Model Number |
|---|---|---|---|
| 2D SENSE<br><br>Capacitive sensor | Wall Mount PVC IP20 | none | TBS-032-STD-WM |
| | | HID iClass | TBS-032-ICL-WM |
| | | HID PROX | TBS-032-PRO-WM |
| | | LEGIC, MIFARE Classic or DESFire | TBS-032-LEM-WM |
| | Flush Mount IP54 | none | TBS-032-STD-FM |
| | | HID iClass | TBS-032-ICL-FM |
| | | HID PROX | TBS-032-PRO-FM |
| | | LEGIC, MIFARE Classic or DESFire | TBS-032-LEM-FM |

## TBS Support

For any additional information please get in touch with TBS support:

email: support@tbs-biometrics.com

phone: +41 (55) 533 2000

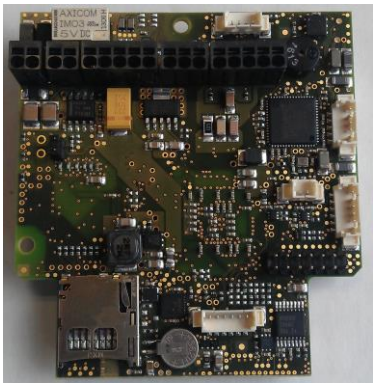
## 2 Hardware Revision Overview

The 2D SENSE fingerprint reader was first introduced to the market in 2013. Since then, several upgrades regarding design and technical components have been implemented and made available in newer versions of this product line. The following table provides an overview of the product history.

*Table 2: 2D SENSE Hardware Overview (all versions are TBS article number TBS-032)*

| Product | Introduced | Display | Board | Sensor | Comment |
|---|---|---|---|---|---|
| 2D TERMINAL | 2013 | 320 x 240 | TCOM300 | optical | |
| 2D TERMINAL | Q4 2016 | 320 x 240 | TCOM301 | optical & cap. | |
| 2D SENSE | Q3 2021 | 640 x 480 | TCOM400 REV01, REV02 | capacitive | PoE & Wifi & BL |
| 2D SENSE | | 640 x 480 | TCOM400 REV03 | capacitive | no PoE/Wifi/BL |
| 2D SENSE | | 640 x 480 | TCOM400 REV04 | capacitive | Quadcore CPU |


2D TERMINAL with TCOM300



TBS-032-TCOM300


2D SENSE TCOM400

TBS-032-TCOM400

All 2D SENSE with black reader front (without green brackets) are equipped with TCOM400.

The exact model can be assessed by either opening a 2D SENSE and inspecting the components or by the Serial Number of the device. The SN of each model is defined to start with these 6 digits:

322304… = built in calendar week 32 in year 2023, equipped with TCOM400 REV04 board.

This manual describes the latest TCOM400 REV04 model. For earlier TCOM400 models please refer to the REV02 version of this installation guide.

The wiring of 2D TERMINALS with TCOM300 boards is described in the general 'TBS Mounting and Installation Guidelines' document.

# 3 Legal and Safety Instructions

## Allowed Applications

TBS products are not designed, authorized, or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of a TBS product can reasonably be expected to result in personal injury, death or severe property or environmental damage. TBS accepts no liability for inclusion and/or use of TBS products in such applications.

## Inspection of goods received

If the packaging or product has been damaged in transport, or should you suspect that it may have a fault, the product must not be put into service. In this case, contact your TBS company representative.

## Installation and Servicing

Installation, setup, and servicing of our appliances must only be carried out by suitably trained personnel.

- Installation and electrical connections must only be made by correspondingly qualified specialists. The relevant national Electrical Engineers construction regulations must be observed.
- Setup and servicing must only be made by persons who have the know how to do so e.g., by reading the respective TBS manuals or attending TBS trainings / webinars.

When not otherwise stated, the following safety instructions apply:

- Installation and servicing of our appliances must be carried out when disconnected from the power supply, in particular appliances that are normally supplied by low-voltage current.
- It is prohibited to alter the device or to remove protective shields and covers.
- Do not attempt to repair an appliance after a defect, failure, or damage, or to put it back into operation again. Please contact in such case your TBS company representative or the TBS hotline.

If there are still some points on which you are not entirely clear, please do not take a chance. All queries can be clarified by your TBS company representative, or by ringing the TBS hotline.

**WASTE DISPOSAL:** This symbol means do not dispose of your product with your other household waste. Instead, you should protect the environment and human health by handing over the marked equipment to a designated recycling facility or an electrical and electronic waste collection point.

## Disclaimers

TBS accepts no responsibility for any injuries or damage caused as a result of improper use.

Information in this document is believed to be accurate and reliable. However, TBS does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Should you discover any fault with the product or in its documentation, or have any suggestions for improvement, please confidently approach your TBS company representative or TBS hotline.

TBS reserves the right to make changes to information published in this document at any time and without notice.

# 4 Declarations of Conformity

## 4.1 European Union (CE) regulatory notices

Products bearing the CE marking comply with one or more of the following EU Directives as may be applicable:

- EMC directive 2014/30/EU
- REACH Directive 1907/2006
- RoHS Directive 2015/863/EU

Compliance with these directives is assessed using applicable European Harmonized Standards.

2D SENSE is intended to be used for professional application only (buildings, airport...).

This is an EMC Class A product according to EMC directive 2014/30/EU. This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcast. The full Declaration of Conformity is available on demand to your reseller. Please, provide him the product model name or its Regulatory Model Number (Model on the label).

## 4.2 USA (FCC) regulatory notices

The 2D SENSE complies with FCC 47 CFR Part 15B. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Responsible Party:

Touchless Biometric Systems AG
Rietbrunnen 2
8808 Pfaeffikon
Switzerland

**NOTE:**
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to FCC 47 CFR Part 15B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

## 4.3 Canada (IC) regulatory notices

WARNING TO USERS IN CANADA / ATTENTION POUR LES UTILISATEURS AU CANADA

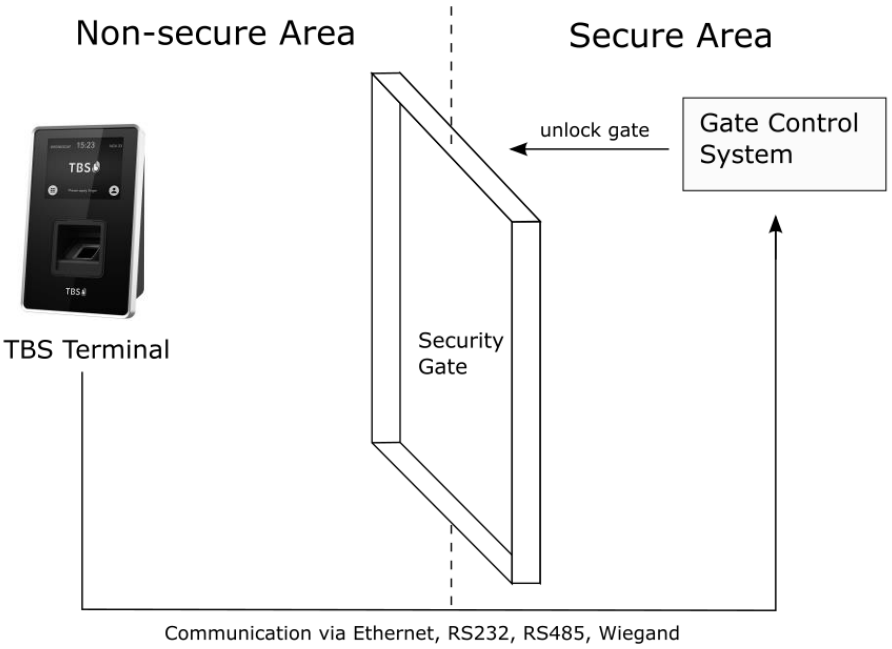
The 2D SENSE complies with ICES 003: 2017 and 2016. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le 2D SENSE est conforme à la norme ICES 003 : 2017 et 2016. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

# 5 Mounting and Installation

## 5.1 Recommended Application

The recommended application is to connect the TBS terminal, mounted in the non-secure area, via Ethernet, RS232, RS485 or Wiegand interfaces to the gate control system located in the secure area.




- The standard installation environment must meet these requirements:
  - Operating temperature -20 to +60 °C
  - Relative humidity 10 to 90%
  - Outdoor device use is not compliant with UL294
- Terminals with standard PVC wall mount box (TBS-032-WM variants) are rated IP20 and are designed for indoor use only. This box is not weatherproof and must not be exposed to water, ice, extreme temperature, direct sunlight, or other adverse weather conditions.
- Terminals with standard flush mount box (TBS-032-FM variants) are rated IP54. This box is designed for use in protected outdoor areas such as shaded entrances or refuges. This box is not suited to be directly exposed to water, ice, extreme temperatures, direct sunlight, or other adverse weather conditions.
- Direct sunlight must be avoided. If the device cannot be installed under shade, a separate roof must be installed that safely protects the device from sunlight. Its main purpose is to protect the device from heat, and to extend its service life by protecting the touchscreen from UV radiation.
- Proper functioning in outdoor installations must be checked for each situation individually, a task that remains in the obligation of the TBS Partner. If required additional shadings or angled installations must be considered.

**NOTE:**

Installation in extreme environments without proper protection may cause permanent device damage and voids warranty.

## 5.2 Outdoor Protection

2D SENSE can be installed outdoors when using the flush mount box.

TBS is offering several outdoor protection kits:

TBS-032-RO, Outdoor Roof black


TBS-032-ROS, Outdoor Roof stainless steel

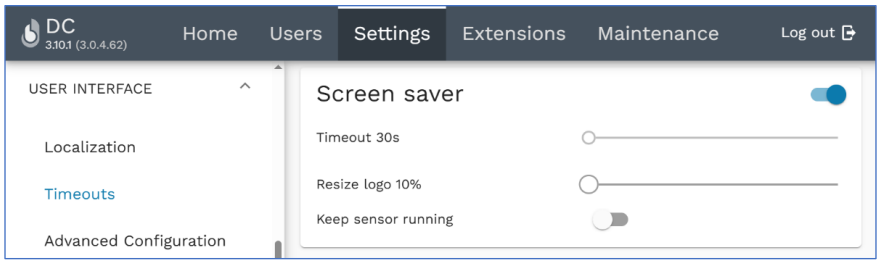

TBS-032-FL, Outdoor Flap

### Software Configuration for outdoor installations

To reduce internal heat generation TBS recommends activating screen saver. Screen saver will extend service life, reduce power consumption and reduce the "light pollution" during the night.

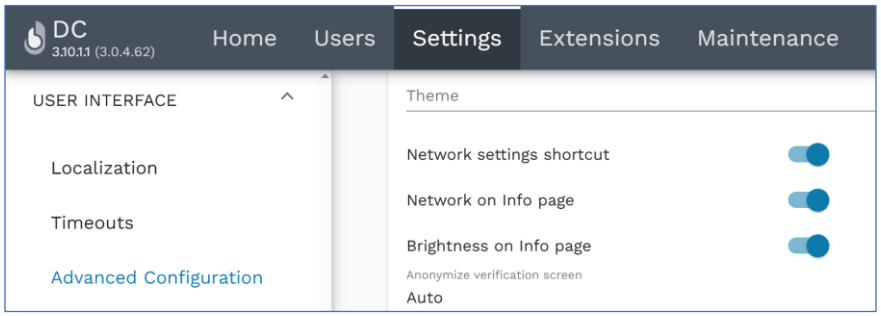
The "Keep sensor running" option allows a user to directly wake up the 2D SENSE by placing its finger on the sensor.

If deactivated, the user first needs to touch the screen to interrupt screen saver.




The option "Brightness on Info page" controls if the screen brightness slider is available on the info pages of the touchscreen.

You could fix brightness to the minimum required level and then deactivate the option to fix settings.



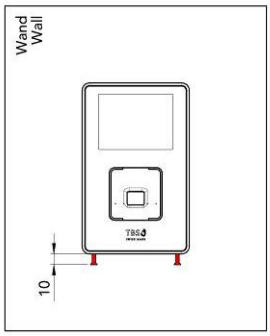
## 5.3 Accessing The Device

The terminal can be accessed by opening two screws on the bottom and removing the front panel. The process is the same for both mounting variants (wall mount, flush mount)

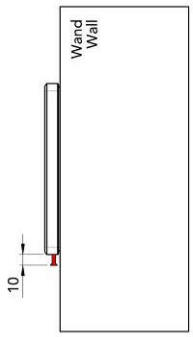
### 5.3.1 Opening the Device

**IMPORTANT:**
Always disconnect power supply before opening terminals.

1




**Unlock**
Unscrew both screws (red) with Allen wrench (size 2) by ~10 mm

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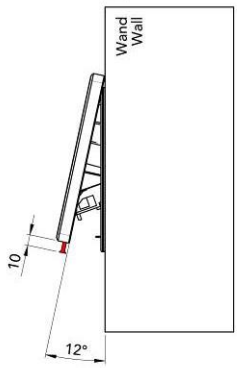
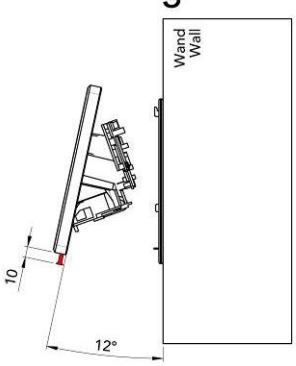


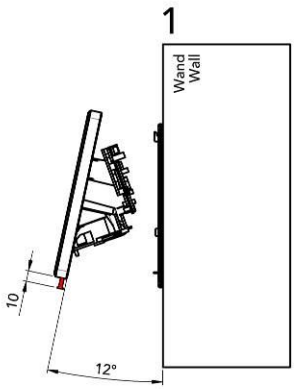

**Open**
Lift up bottom part to have it angled ~12° from vertical axis, then carefully slide upwards. Please do not press hard!

3

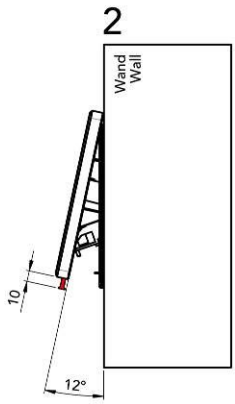



**Remove**
Remove device carefully from back cover.
Remove cables if required.

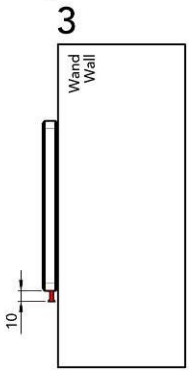
### 5.3.2 Closing the Device



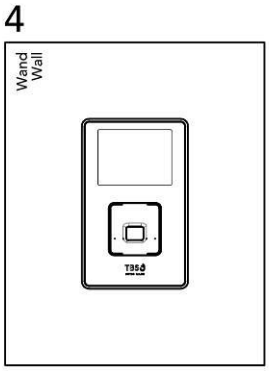

**Align and position**
Unscrew both screws (red) with Allen wrench (size 2) by ~10 mm




**Hook in**
Hook in device to back cover at the top. Keep device angled ~12° from vertical axis




**Close**
Slightly press bottom part towards back cover




**Lock**
Screw both screws with Allen wrench (size 2) into device.
Be careful not to overtighten the screws, this is not necessary and may mean that they cannot be loosened later.

**IMPORTANT:**

Please do not press hard! Take care of cabling, cables must not press on electronic boards!

To avoid destruction and electrical shorts please ensure no cable or metal parts press against the electronic boards inside the device!

Please keep cables inside the device as short as possible. Do not feed other cables through device!

## 5.4 Mounting Instructions

### 5.4.1 Preparation

**IMPORTANT:**

Make sure that all power sources for the device are turned off before installation.

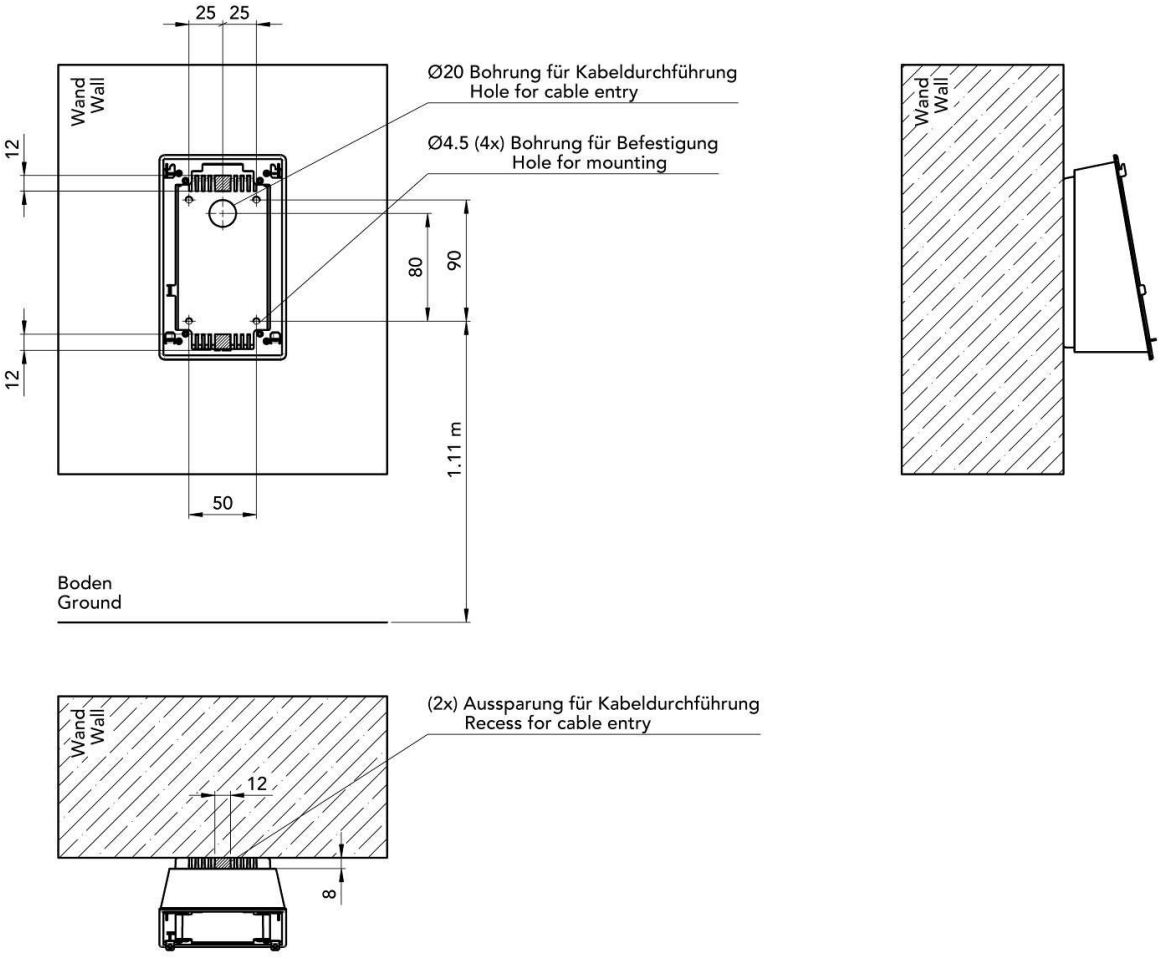
Before mounting the device, make sure of the following points to achieve an optimal installation:

- The mounting strength of the terminal depends on the solidity and material of the wall. Make sure to use an appropriate method to anker the mounting screws such as raw plugs.
- Make sure to leave sufficient space in the wall behind the installation for the passage of cables.
- Make sure that the installation wall is completely flat, to allow a nice and proper mounting. TBS provides very accurately manufactured enclosures that only fit to the mounting box if no obstacles are present between the wall and the terminal front.

### 5.4.2 Wall Mount Terminal

The following equipment and tools are required for mounting the wall mount variant.

- Four ø4-5mm screws and fitting raw plugs suitable for the wall material (not included)
- One screwdriver appropriate to drive the above screws
- One drill with a drill bit of an appropriate diameter for the above raw plugs
- One Allen wrench (size 2) screwdriver to open the terminal

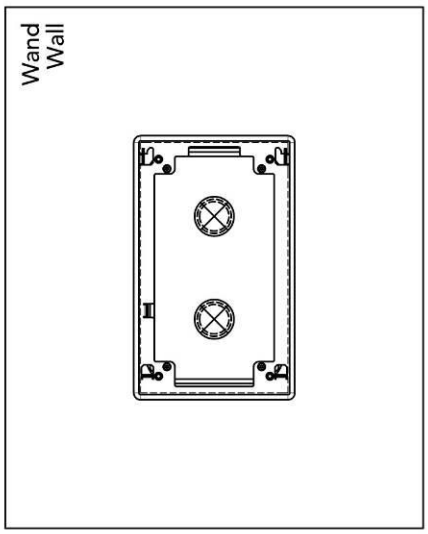


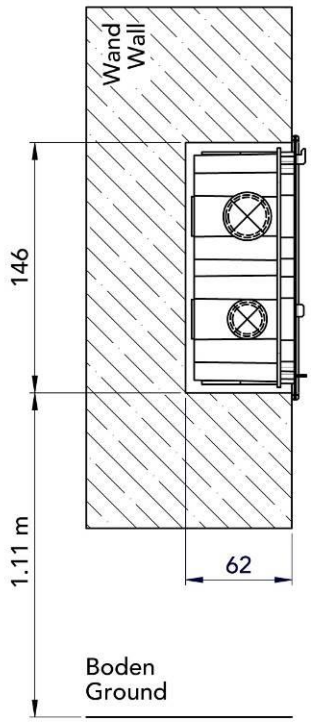

The recommended mounting height of the terminal is 1.10 m, measured from the floor to the lower screw holes of the back cover.

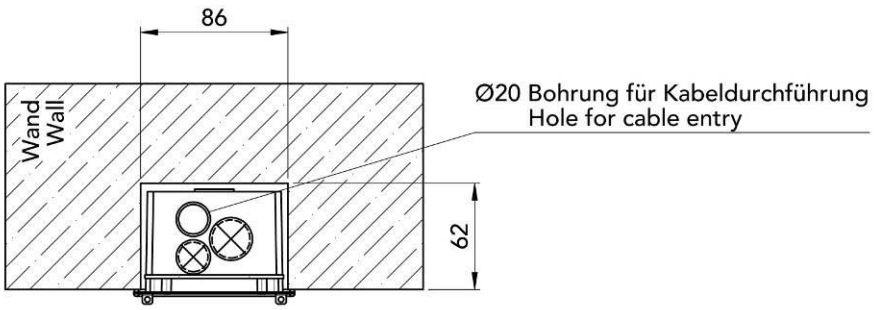
### 5.4.3 Flush Mount Terminal

The following equipment and tools are required for mounting the flush mount variant.

- Four ø3.5mm screws and fitting raw plugs suitable for the wall material (not included)
- One screwdriver appropriate to drive the above screws
- One drill with a drill bit of an appropriate diameter for the above raw plugs
- One Allen wrench (size 2) screwdriver to open the terminal




The recommended mounting height of the terminal is 1.10 m, measured from the floor to the lowest part of the flush mount cover box.

Both types of installation boxes are made of flame-retardant material.

**IMPORTANT:**

It is strongly recommended to use upper cable duct. Please do not use cable ducts marked ⊗ (see above).

# 6 Power and Signal Wiring

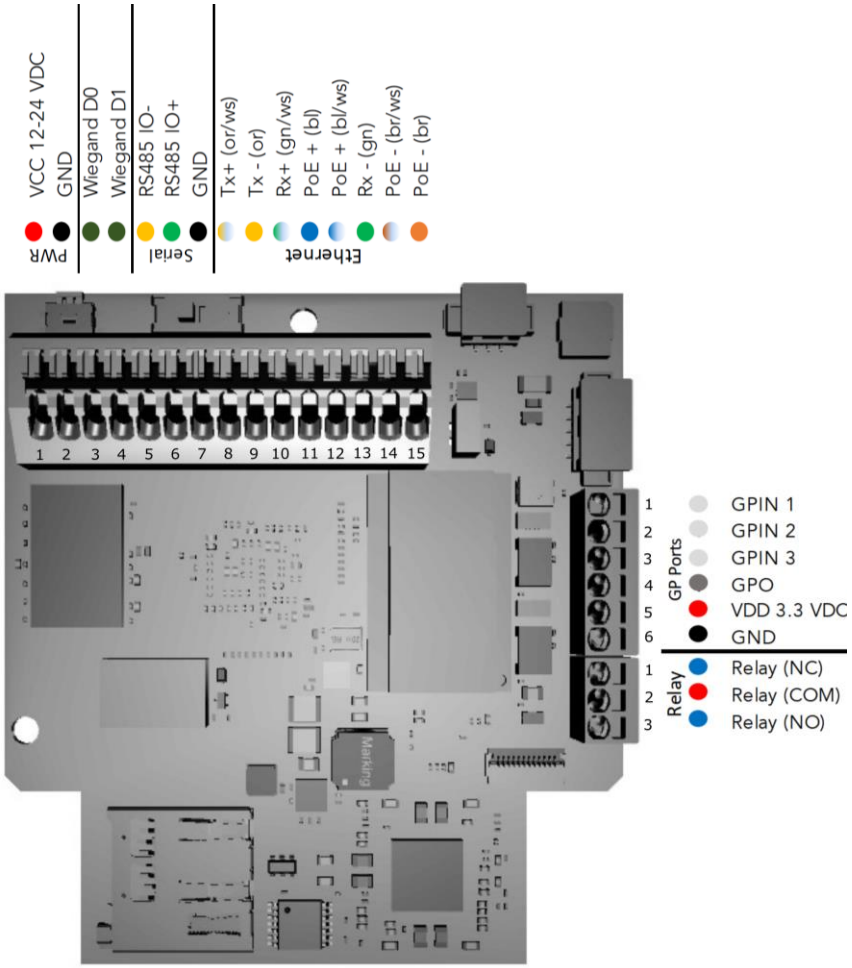
**IMPORTANT:**

For all signal wiring, including ethernet cables, it is recommended to connect cables of less than 30m to avoid surge current spikes that may damage the equipment.

## 6.1 Electrical Connection and Cabling

Since Q3/2021 all TBS 2D SENSE are equipped with 'TCOM400' boards. An adhesive tag marks the installed board type.

The on-board wire terminals are located on the main board of the terminal and are accessible after separating the front and back panels.




**IMPORTANT:**

For GPIN 1-3 the VDD 3.3 VDC can be used.

For serial interface, connect 'Serial GND' to GND of your controller.

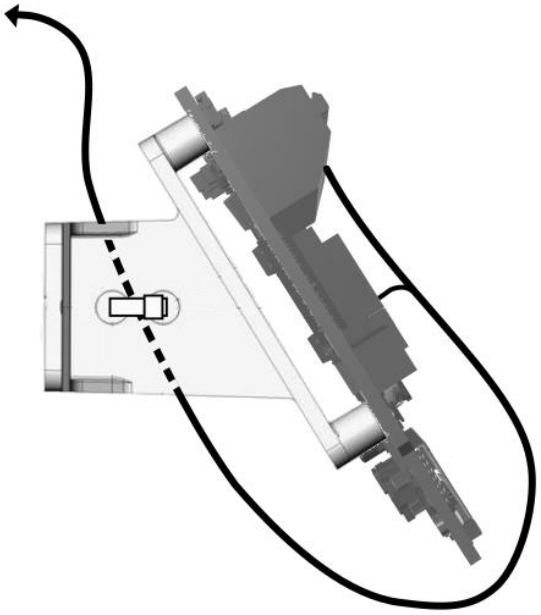
Do not power the device before all cable connections are properly made. Otherwise, there is risk of damaging the device.

**NOTE:**

Removing cables with force from the wire terminal may damage the wire terminal or the board. Unlock the latches before removing, otherwise wires can no longer be fixed, and board needs to be replaced. **This is not covered by TBS standard warranty!**

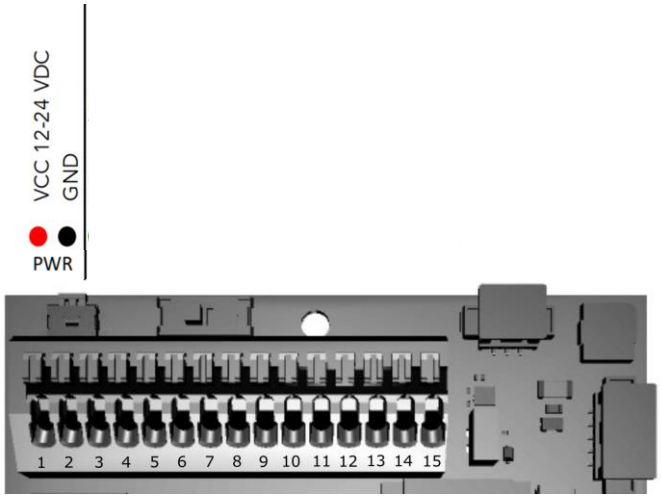
To relieve any installed cables from undesired stress on the wire terminals, the following strain relief method can be employed. All cables leading out from the terminals should be routed down over the board and then underneath and through the mounting bracket out.

There are two separate holes in the mounting bracket that allow to fixate the cables with a zip tie.



## 6.2 Power Supply

Power and ground shall be supplied to the PWR wire terminals located on the top.




| Wire Terminal Number | 2D SENSE Label | Type |
|---|---|---|
| 1 | VCC 12-24 VDCC | Voltage |
| 2 | GND | Ground |

### 6.2.1 Wiring Recommendations

TBS recommends using a AWG16 gauge and 12-24V power supply when PoE supply is not used. The voltage specified is the one measured on the product block connector: 12V-24V (-15% / +10%).

The voltage drop due to the cable shall be considered. Table 3 shows the maximum distance between power supply and one unique device, depending on cable gauge and power supply rating.

*Table 3: Maximum cable length in meters between power supply and one TBS terminal*

| Wire Size | | Maximum distance [m] | |
|---|---|---|---|
| $mm^2$ | AWG | for 12 V ±10% | for 24 V ±10% |
| 0.32 | 22 | 2 | 70 |
| 0.52 | 20 | 3 | 115 |
| 0.82 | 18 | 6 | 185 |
| 1.31 | 16 | 9 | 280 |

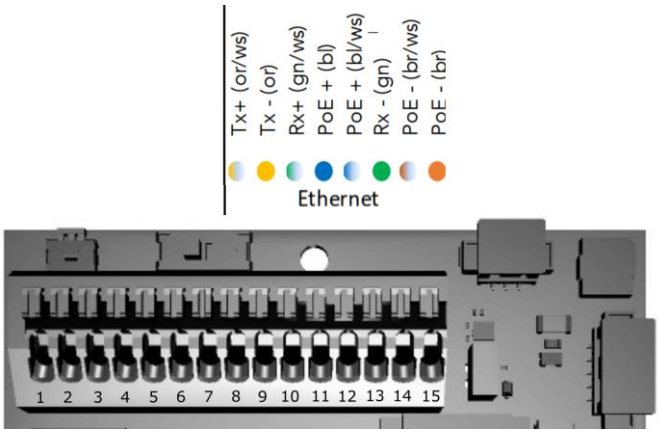
### 6.2.2 Clarification: No Power over Ethernet

2D SENSE does not support Power over Ethernet (PoE).

Only the first two revisions of the TCOM400 board supported PoE, please refer to the respective REV02 version of this manuals for these older models.

## 6.3 Ethernet Connection

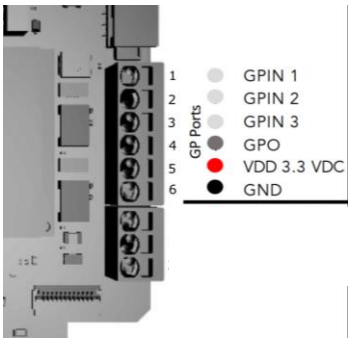
For Ethernet connections, the wire terminal board provides LAN connectors compliant with IEEE802.3at. The strands of the cable need to be individually inserted into the wire terminal according to the table below.




| Wire Terminal Number | 2D SENSE Label / Wire Standard | Standard Wire Color | |
|---|---|---|---|
| 8 | Tx+ | orange/white | |
| 9 | Tx- | orange | |
| 10 | Rx+ | green/white | |
| 11 | PoE + | blue | |
| 12 | PoE + | blue/white | |
| 13 | Rx - | green | |
| 14 | PoE - | brown/white | |
| 15 | PoE - | brown | |

**NOTE:**
The coloring of the individual cable strands may vary from cable type to cable type. Make sure that you are connecting them according to the ethernet cable labels.

## 6.4 General Purpose Input Output

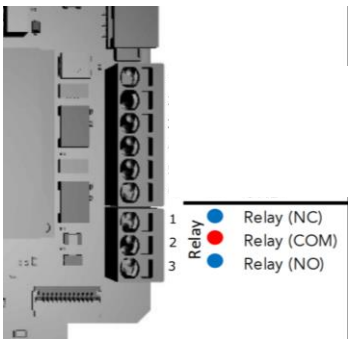



Three general purpose inputs and one general purpose output are available on a detachable wire terminal block. These inputs can be used for interconnection with a door monitoring switch, request to exit button or other equipment.

| 2D SENSE Label | Name | Power Rating |
|---|---|---|
| 1 | GP In 1 | 3.3 V TTL Compatible |
| 2 | GP In 2 | 3.3 V TTL Compatible |
| 3 | GP In 3 | 3.3 V TTL Compatible |
| 4 | GP Out | 3.3 V TTL Compatible |
| 5 | 3.3V Line | |
| 6 | Ground | |

**NOTE:**
It is recommended to connect ground for reference.

## 6.5 Integrated Relay




| Wire Terminal Number | 2D SENSE Label | Usage | Power Rating |
|---|---|---|---|
| 1 | Relay (NC) | Normally Closed | |
| 2 | Relay (COM) | Common | 30 VDC, 1A |
| 3 | Relay (NO) | Normally Open | |

TBS recommends to not operating the relay at the upper level of the voltage range for long periods of time as this may shorten its life span.

TBS recommends not to power devices constantly through the relay as this may shorten its life span.

**DISCLAIMER:**

The on-board relay must not be used to activate security access equipment such as gates or doors to grant access to secure areas, as it can be accessed and bridged by an intruder. Only non-security critical functionality such as lights may be directly activated using the internal switch.

Use the data communication capabilities of the device (ethernet, serial interfaces) to communicate to relays inside the secure area to activate security access equipment. For such, TBS offers two dedicated controllers.

## 6.6 Connecting TBS Controllers

For various applications TBS terminals need to be connected with external controllers, e.g. to open a door. TBS offers two own solutions:

- TBS CONTROLLER SMART+ (4 relays, 4x GPIN, 4x GPOut, connected via RS-485 or LAN)
- TBS CONTROLLER LITE (RelayBoard with 2 relays, connected via RS-485)

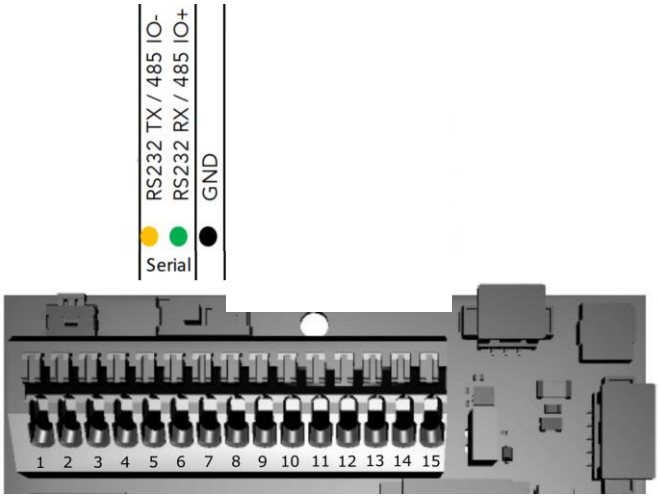
## 6.7 Connecting Third Party Controllers via Serial Interface

The TCOM400 board features an on-board switch allowing to set the serial interface type to either RS485 or RS232. This switch is set to RS485 as standard.

The switch positions are marked in the picture.

To use RS232, make sure the device is powered off and disconnected, and only then move the switch.


Connect the RS485 or RS232 serial lines directly from TBS device to controller, and ensure you connect Ground as well:




| Terminal Wire Number | 2D SENSE Label | Name | Type | Voltage Level |
|---|---|---|---|---|
| 5 | RS 485 IO- | Data - | In/Out | 0V-5V Bias (+-7V Offset) |
| 6 | RS 485 IO+ | Data + | In/Out | 0V-5V Bias (+-7V Offset) |
| 7 | GND | Ground | | |

For farthest terminal a 120-Ohm resistor termination may be added outside the terminal between D+ and D-.

**IMPORTANT:**

The TCOM400 platform requires common RS485 GND connection with the Controller to work and prevent damaging the board. It is mandatory to connect 'Serial GND' to the GND of your controller.

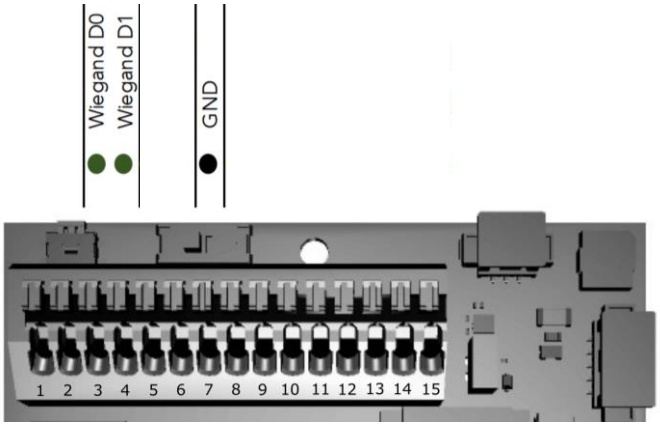
If your door controller does not offer a dedicated RS485 GND line, it is up to the installer to select a fitting GND source for the serial interface. In case the 2D SENSE is powered from the controller, RS485 GND can be connected to PWR GND.

Do not power the device before all cable connections are properly made. Otherwise, there is risk of damaging the device.

## 6.8 Connecting Third Party Controllers via Wiegand

Connection to 3rd party controllers can also be done via Wiegand interface. TBS devices offer Wiegand output lines supporting various standard formats (26 and 37bit).

The 2D SENSE provides Wiegand OUT connections that can be directly connected to the corresponding 3rd party controller Wiegand IN.




| Wire Terminal Number | 2D SENSE Label | Name | Type | Voltage Level |
|---|---|---|---|---|
| 3 | Wiegand D0 | Connection Zero | Out | Wiegand Out (3.3V TTL) |
| 4 | Wiegand D1 | Connection One | Out | Wiegand Out (3.3V TTL) |
| 7 | GND | Ground | | Ground for Wiegand |

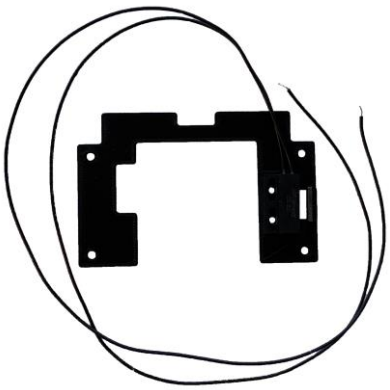
The 2D SENSE's Wiegand interface works with LV-TTL (3.3V) voltage level. In most cases, this level is sufficient to drive TTL (5V) inputs on the receiver's side.

In case your controller is unable to handle with LV-TTL voltage, an external 3.3 V to 5 V level shifter must be added to both D0 and D1 lines.

## 6.9 Tamper Switch

TBS 2D SENSE can be equipped by a tamper switch that detects when the device front is opened. The trigger is activated when the device front is lifted a few Millimeters from the mounting box.

The tamper switch is available as optional accessory with the TBS article number TBS-032-TAM.



Function

Activation creates an internal event in the TBS reader that can be used to trigger actions, like deleting internal database or sending an alarm output via relay.

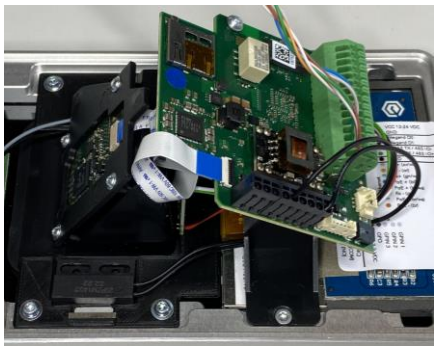
Installation

Remove the TCOM board holder.

Remove the sensor holder and replace it with the new unit.

Re-install the TCOM board holder.

Connect the two cables to the TCOM400 board to VDD and one of the 3 available GPIN.



Configuration

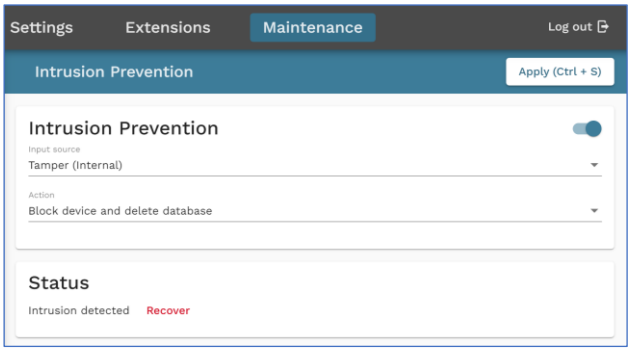
Login to DeviceConfig web interface of the reader and go to 'Maintenance' tab.

In menu 'Intrusion Prevention' activate the slider for 'Intrusion Prevention', select 'Tamper (internal)' input source and select your preferred action. Available are:

***None*** *(only internal event is logged)*

***Block device***

***Block device and delete database***




If required, configure addition actions in 'Settings – Actions', select tamper switch as the input and configure the action you want to set, e.g. triggering the internal relay or GPOUT to forward the tamper alarm to a third-party controller via wire signal.

To recover from an intrusion, click on 'Recover', and if needed reload database using command from TBS server (Client list -> reload DB on client).

## 6.10 Wifi and Bluetooth by USB dongles

Only the first two revisions of the TCOM400 board featured on-board Wifi and BL interfaces.

For the 2D SENSE currently sold please order these additional accessory dongles:

TBS-032-WLAN, 2D SENSE WLAN Module

TBS-032-BT, 2D SENSE Bluetooth Module

# 7 Appendix

## 7.1 Maintenance

Cleaning

Prior to disinfection the devices should be cleaned to remove dust or dirt.

Use warm water with a few drops of soap or a combined cleaning & disinfection liquid normally used to wash hands. Don't use aggressive detergents.

The capacitive sensor of 2D SENSE is susceptible to scratches. Use soft towels for cleaning only, don't use abrasive cleaning equipment.

Pay attention never to use aggressive chemical cleaning agents; these could attack the sensor surface and the plastic coatings around the sensor or the device itself.

Disinfection

TBS devices can be disinfected with antiseptic liquid, e.g. Sagrotan, Dettol or a similar disinfectant applied as a spray.

Function check

TBS terminals are designed for permanent usage. Therefore, problems in the operation of the devices are detected during regular usage. Special tests to check for correct functioning are therefore not required.

TBS recommends checking the integrity of the sensor surfaces at least every 6 months. If the devices are used in environments with dust or where oily substances are handled or other extraordinary environmental factors are present, the sensor surfaces need to be checked and cleaned with increased frequency.

## 7.2 Trouble Shooting

The following table provides brief description of device error codes and quick resolutions.

| Error code | Description | Resolution |
|---|---|---|
| 0 | No error. | |
| 1 | General error. | |
| 42 | Sensor image caching (sensor returned two same images in a row). | |
| 100 | Unknown DB error. | |
| 101 | DB empty. | Add users or reload database from BioManager. |
| 102 | Database limit reached. | |
| 103 | DB corrupted. | Reload database from BioManager. |
| 200 | Unknown configuration error. | Verify the settings in DeviceConfig. |
| 201 | Wrong configuration set. | Verify the settings in DeviceConfig. |
| 300 | Unknown server communication error. | |
| 301 | Device blocked (Off Active flag on server). | Enable active flag on BioManager. |
| 302 | Device blocked remotely using RemoteControl interface. | |
| 303 | Device not connected to server (either wrong configuration or connection problems). | |
| 304 | Device not validated on server. | Validate the device on BioManager. |
| 305 | Device in non-operable state - DB reload in progress. | Wait for DB reload process to complete. |

| Error code | Description | Resolution |
|---|---|---|
| 400 | General HW error. | |
| 401 | Intrusion detected. | Resolve using DeviceConfig under Maintenance / Security / Intrusion Prevention page. |
| 410 | Unknown sensor error. | |
| 411 | Sensor lost from USB interface. | |
| 412 | Sensor incorrect behaviour - sensor thread stops etc. | |
| 413 | Wrong sensor configuration. | |
| 414 | Runtime sensor error. | |
| 415 | Sensor too long in pos. loop three times in row. | The sensor is continuously triggered either manually or by external light or object inside sensor cavity. Rectify the cause and re-power the device. |
| 420 | Unknown RFID error. | |
| 421 | RFID initialization failed. | Ensure that RFID module is connected. |
| 422 | RFID runtime error (e.g. communication with reader failed). | Shutdown and re-power the device. |
| 423 | RFID card reading error. | |
| 430 | Unknown Relay/GPIO error | |
| 431 | Relay/GPIO communication error | |
| 440 | General problem with external verification initiated from 3rd party software. | |
| 441 | Empty token comes from external device. | |
| 500 | General logic error. | |
| 501 | User presented card in smartmode and he does not have it allowed. | Enable RFID flag in 'Id factors' for user in BioManager. |
| 600 | Unknown profile set. | |
| 601 | Wrong profile configuration. | |
| 602 | Communication error in profile (e.g. with SmartController). | |
| 701 | Too many pending access infos (TnA records) in the cache (device offline for long time). | Verify the connection to XML or WE server. |
| 702 | Enrollment error appeared (e.g. due to UserID duplication reported by server). | Delete error user in Admin DB page and ensure duplicate UserID or PIN code is not enrolled again. |
| 703 | One or more enrollments are pending on device (device is offline). | Verify the connection to WE server. |
| 800 | Too old BSP version for current FW or BSP Unknown reported. | |
| 900 | Unknown (general) camera error. | |
| 901 | Camera service communication error. | Verify camera endpoint configuration in DeviceConfig and ensure camera service is running on server. |
| 1000 | General network error. | |
| 1001 | No Wifi signal. | |
| 1002 | Low Wifi signal. | |

## 7.3 TBS Port Assignments

The following table lists all TCP/UDP ports that are used in TBS software and firmware as part of the biometric subsystem infrastructure.

In case an installation is not going to use all TBS components TBS offers, some of the available services will not be needed, and the respective ports do not have to be open.

*Table 3: Port Assignments for BIOMANAGER ENTERPRISE installations (BME, Firmware 3.xx):*

| Machine | Port | Protocol | Comment | Inbound | Outbound |
|---|---|---|---|---|---|
| **BME Server PC** | | | | | |
| Secure device channel (1) | 8808 | HTTPS | default communication channel. BME installer sets required firewall settings by default | Yes | No |
| **Biometric Client Service PC** | | | | | |
| BME channel (1) | 8808 | HTTPS | communication channel to BME server and Device Control Center (DCC) | No | Yes |
| Enrollment API | 8281, 8282, 8284 | HTTP/S | communication channel between enrollment components. | Yes (2) | No |
| | 8283 | MQTT | | | |
| **Enrollment PC** | | | | | |
| BME channel (1) | 8808 | HTTPS | communication channel to BME server and Device Control Center (DCC) | No | Yes |
| **Terminal** | | | | | |
| BME On-Prem (1) | 8808 | HTTPS | communication channel to BME local server and Device Control Center (DCC) | No | Yes |
| BME CLOUD | 443 | HTTPS | communication channel to BME Cloud server | No | Yes |
| DeviceConfig | 443/8808 (4) | HTTPS | public web interface to configure devices | Yes | No |
| DeviceConfig (3) | 18883 | MQTT | additional web sockets based control channel | Yes | No |
| DeviceControl | 8200 | HTTPS | public interface to remotely control devices | Yes | No |

(1) Can be customized during installation

(2) Ports are bound only to localhost

(3) Not used anymore in FW3

(4) 443 is used by all terminals except 3D FLASH+ which uses port 8808 instead

*Table 4: Port Assignments for WebEdition installations (WE, Firmware 2.xx):*

| Machine | Port | Protocol | Comment | Inbound | Outbound |
|---|---|---|---|---|---|
| **WE Server PC** | | | | | |
| Device channel | 80 | HTTP | default communication channel (SOAP needs to be enabled in firewall settings, if deep inspection mechanisms are used) | Yes | No |
| Secure device channel (1) | 443 | HTTPS | optional secure communication channel (SOAP needs to be enabled, see above) | Yes | No |
| **Biometric Client Service PC** | | | | | |
| WE channel (1) | 80/443 | HTTP/S | communication channel to WE server and Device Control Center (DCC) | No | Yes |
| Enrollment API | 8281, 8282, 8284 | HTTP/S | communication channel between NT service and JavaScript component | Yes (2) | No |
| | 8283 | MQTT | | | |
| **Enrollment PC** | | | | | |
| WE channel (1) | 80/443 | HTTP/S | communication channel to WE server and Device Control Center (DCC) | No | Yes |
| **Series12 terminal** | | | | | |
| WebEdition (1) | 80/443 | HTTP/S | communication channel to WE server and Device Control Center (DCC) | No | Yes |
| DeviceConfig Firmware 1 or 2 (1) | 443 | HTTPS | public web interface to configure devices | Yes | No |
| DeviceConfig Firmware 2.xx | 18883 | MQTT | additional web sockets based control channel | Yes | No |
| DeviceControl | 8200 | HTTPS | public interface to remotely control devices | Yes | No |
| RemoteControl | 8220 | HTTPS | internal interface to remotely control devices, incl. enrollment | Yes | No |
| RemoteEnroll (3) | 8282 | HTTPS | internal interface required for remote enrollment | Yes | No |
| **Terminal Updater PC** | | | | | |
| UDP channel | 47815 | UDP | required for remote firmware update | Yes | No |
| TCP channel | 47816 | TCP | required for remote firmware update | Yes | No |

(1) Can be customized during installation

(2) Ports are bound only to localhost

(3) Port is not mandatory in FW 2.xx since DCC channel is used for enrollment

## 7.4 References to other TBS documents

**TBS Installation Manuals**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/U4WH2UCY38G7FbY
Main directory for all TBS installation manuals, including this manual.

**TBS 2D SENSE Mounting and Installation Guideline**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/Pn7MZFC1EwLzwED
The QR code printed on the product opens this link, leading to the 2D SENSE product folder from where this manual is available.

**TBS Terminal Firmware**

https://biometrics.talentlms.com

TBS Partner Portal with full product documentation and access to latest firmware for terminals. Access is restricted to registered TBS Partners.

**TBS System Requirements**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/q8V3hzrLyR0Mnyg

Summarizes the prerequisites a site needs to offer regarding server & network to host a TBS installation.

**TBS Short instruction - Biometric Enrollment on 2D SENSE**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/i1xwVOwEkL9sINM

Provides guidance for the enrollment process to TBS system operators.

**TBS Short instruction - Finger positioning on 2D SENSE**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/2YOqSgSRA51PKVV

Provides guidance for finger positioning on a 2D capacitive sensor to TBS system operators.

**TBS Manuals for TBS System Operators (Endusers)**

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/JBNh6zAMJbRQoZD

Access all published manuals for TBS system operators, including the above short instruction.